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Case Report

First documented case of ichthyosis prematurity syndrome in Iraq: A case report with literature review ☆,☆☆

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ABSTRACT

Ichthyosis Prematurity Syndrome (IPS) is a rare autosomal recessive disorder characterized by premature birth, respiratory distress, and distinctive skin abnormalities. Infants with IPS typically present between 30 and 34 weeks of gestation with a thick, caseous, desquamating epidermis resembling vernix caseosa. We report a case of a female neonate born at 30 weeks, weighing 1400 grams, with severe respiratory distress and characteristic skin abnormalities. Immediate intervention, including mechanical ventilation and surfactant therapy, was essential. Histopathological examination revealed hyperkeratosis, parakeratosis, and a thickened stratum corneum, with genetic testing confirming FATP4 gene mutations. Comprehensive care by a multidisciplinary team, including CPAP, emollients, and enteral feeding, led to significant improvement, and the neonate was discharged after 4 weeks. This is the first reported case of IPS in Iraq. This case highlights the importance of early recognition, genetic testing, and a coordinated care approach for managing IPS, emphasizing the need for awareness of its characteristic features to improve patient outcomes.

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Introduction

Ichthyosis prematurity syndrome (IPS) is a rare autosomal-recessive disorder characterized by premature birth, respiratory distress, and distinctive skin abnormalities. Typically, infants with IPS are born between 30 and 34 weeks of gestation, presenting with thick, caseous, and desquamating epidermis that resembles vernix caseosa. This condition often leads to neonatal asphyxia and requires immediate medical intervention, including respiratory support [1,2].

The histopathological skin manifestations of IPS reveal hyperkeratosis, parakeratosis, and a thickened stratum corneum. Such skin changes, along with respiratory distress, are the main clues for earlier diagnosis. Genetic mutations identified in the fatty acid transport protein 4 (FATP4) gene, also called SLC27A4, were implicated as the major cause of IPS. These mutations alter lipid metabolism and impede keratinocyte differentiation and the function of the skin barrier [3].

Family history is normally indicative of consanguinity, which increases the chances of autosomal recessive inheritance. Although more cases of IPS have been reported in Scandinavian populations, they have been reported worldwide, which indicates a higher prevalence of it [4].

The management of IPS is primarily supportive. It involves mechanical ventilation for respiratory insufficiency and careful skin management to prevent infections and further desquamation. Typically, emollients are used to support skin hydration and maintenance of skin integrity [1,5].

In the big picture, early identification and diagnosis of IPS are very important to the therapeutic gain of treatment. Genetic counseling and testing are critical to the management of the disorder and in supporting affected families. The condition generally improves with age, and many children experience significant recovery with appropriate care [6].

In this paper, we will present a case of a female neonate diagnosed with IPS and the role of early recognition and comprehensive management. This is the first case report in Iraq and important for increased awareness of this rare condition in the region.

Case presentation

A female neonate was delivered prematurely at 30 weeks of gestation via normal vaginal delivery, weighing 1400 grams, with a length of 42 cm and a head circumference of 30 cm. She exhibited respiratory distress characterized by tachypnea, grunting, and retractions, necessitating immediate neonatal resuscitation and mechanical ventilation.

The skin was thick, white, and desquamating, resembling vernix caseosa, particularly noticeable on the trunk and extremities (Figs. 1 and 2), with no significant abnormalities in cardiovascular, gastrointestinal, or neurological examinations. She had no dysmorphic features. The neonate's family history was notable for consanguinity, but had no known history of ichthyosis. The Initial diagnostic workup included a chest X-ray showing bilateral diffuse infiltrates consistent with respiratory distress syndrome (RDS) (Fig. 3) and blood tests revealing normal CBC and corrected electrolyte imbalance. A skin biopsy revealed hyperkeratosis, parakeratosis, and a thickened stratum corneum.

Differential diagnoses included various genetic skin disorders and respiratory conditions, with the biopsy findings being crucial for diagnosing IPS. Genetic testing confirmed mutations in the SLC27A4 gene, and genetic counseling emphasized the autosomal recessive inheritance pattern and future pregnancy implications. A multidisciplinary team of neonatologists, dermatologists, geneticists, and pediatric pulmonologists provided comprehensive care, focusing on respiratory and dermatological management.

The neonate received CPAP and surfactant therapy, regular emollient application, gentle skin care, and enteral feeding with careful monitoring. Over 2 weeks, the neonate gradually weaned off respiratory support, with skin condition improving and desquamation decreasing. After being discharged from the NICU after 4 weeks, follow-up included dermatology and genetics consultations. Postdischarge, growth, and developmental milestones were monitored, with ongoing skin care and genetic insights provided.

The child has undergone typical physical and mental development at the age of 1 year. She needs antihistamines and ointments on a regular basis because her skin is extremely dry, and she suffers from severe itching dermatitis. She also has recurrent skin infections.

Discussion

IPS is a rare genetic disorder characterized by abnormal skin development and lipid metabolism disruptions, leading to thickened and desquamating skin resembling vernix caseosa. It typically presents in premature neonates with respiratory distress. This case is significant due to the rarity of IPS, making each report valuable for medical knowledge. The patient's family history of consanguinity and severe initial presentation highlight the genetic basis and management challenges. Early diagnosis and a multidisciplinary approach are crucial for optimal outcomes, emphasizing the importance of awareness and timely intervention.

There are 4 important features of IPS: prematurity, skin abnormalities at birth (where the epidermis can be unevenly thickened, caseous, and desquamating, either in specific areas or all over the body), respiratory distress (with newborns potentially experiencing respiratory failure due to blocked airways, which can be fatal), and eosinophilia (as perinatal eosinophilia has been documented). Our case exhibited all these features except for eosinophilia, suggesting that the condition's presentation may be variable.

At birth, the neonate weighed 1400 grams, which is below the average weight for neonates with this condition. The median birth weight for IPS is reported to be 2060 grams (range: 1760–2480 grams). The neonate's family history was notable for consanguinity but had no known history of ichthyosis, indicating an autosomal recessive pattern consistent with previous studies [7].

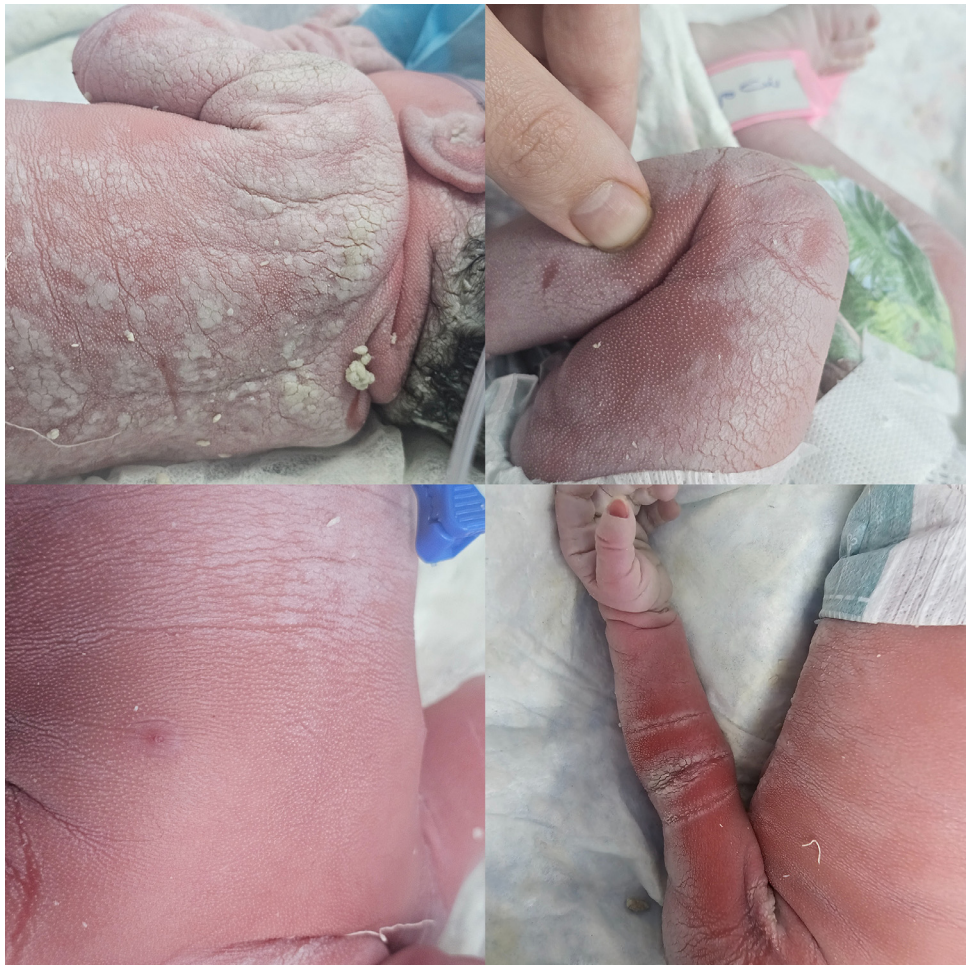

Fig. 1 – Clinical photo of the patient showing thick white caseous scales over different body parts.

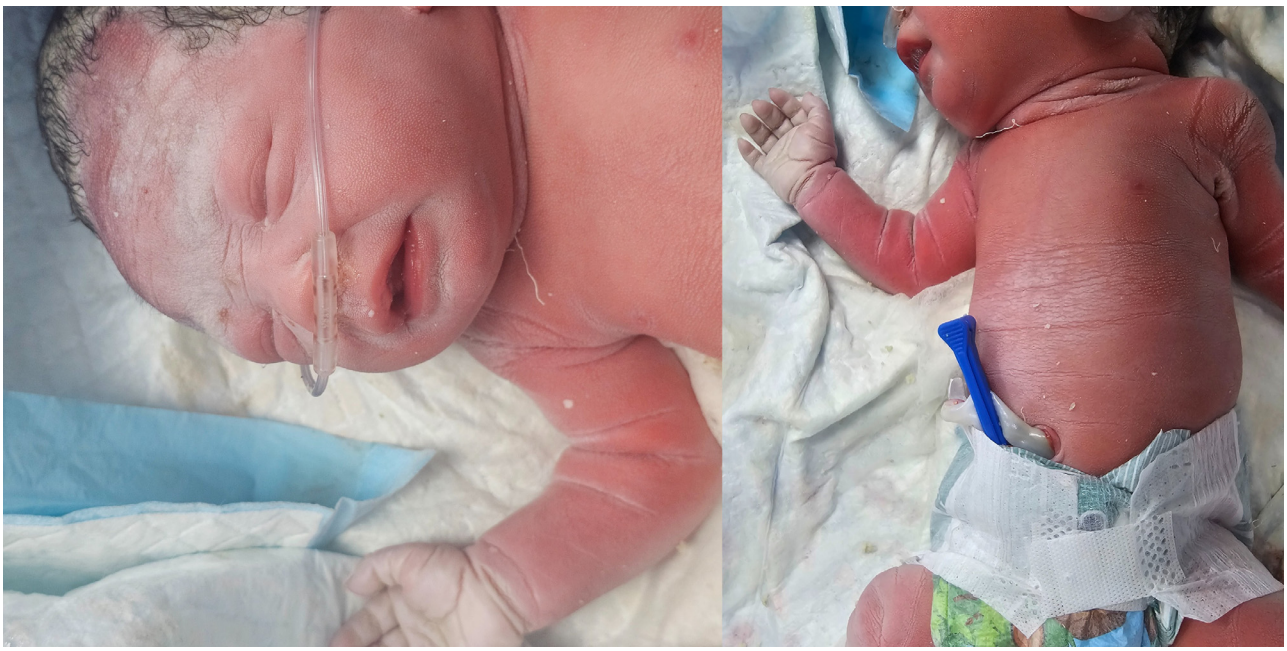

Fig. 2 – Clinical photo of the patient showing thick white caseous scales over different body parts.

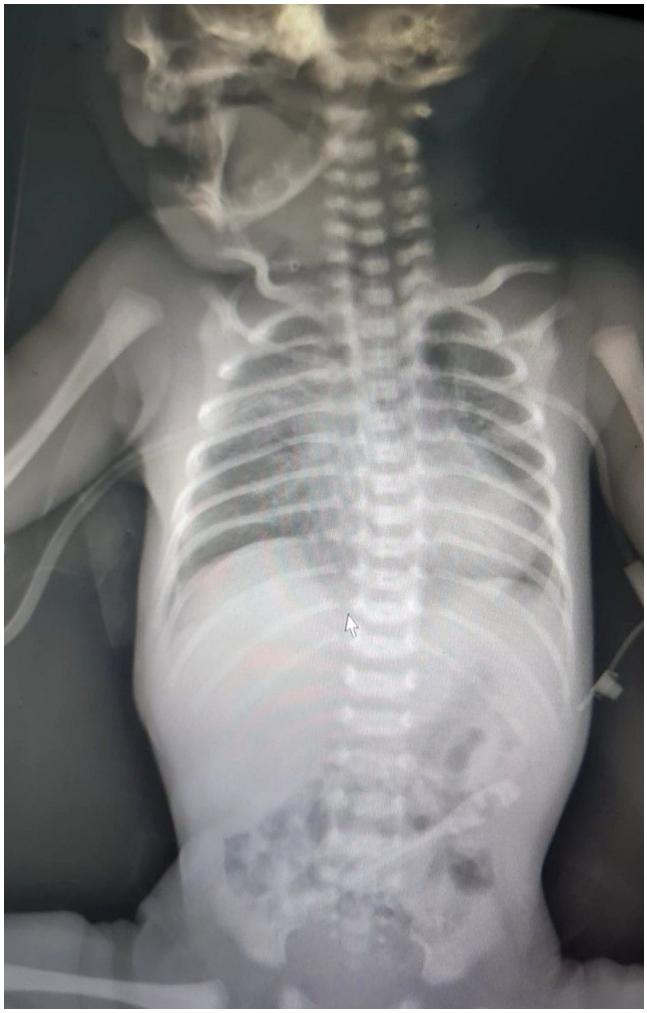

Fig. 3 – X-ray AP view, which shows bilateral diffuse infiltrates consistent with respiratory distress syndrome (RDS).

According to the literature, IPS is a rare autosomal recessive disorder first recognized in 1993. Some sources suggested using the term "Self-Healing Congenital Verruciform Hyperkeratosis" to describe IPS, as the skin findings improve spontaneously, unlike other forms of congenital ichthyosis [8]. However, some patients may persist with skin xerosis or atopy. Neonatal asphyxia in IPS is thought to be due to the aspiration of skin debris shed into the amniotic fluid. Antenatal ultrasound may show separation of chorionic and amniotic membranes and polyhydramnios with a starry sky appearance [8,9].

The histopathology of IPS-affected skin is pathognomonic, showing acanthosis, hyperkeratosis, and characteristic aggregates of curved lamellar structures in the perinuclear cytosol of the stratum corneum and stratum granulosum. Perivascular inflammation with eosinophilia has also been observed in some cases. On electron microscopy, some authors described IPS as displaying worm-like structures in corneocytes. Some patients have transient blood eosinophilia on occasion.

Respiratory complications are the leading cause of death in IPS due to the inhalation of skin debris. Given that lung pathology in IPS might be due to aspirating skin debris, systemic steroids are proposed to help mitigate respiratory complications [10].

This case underscores the importance of considering IPS in neonates presenting with premature birth and distinctive skin findings. Early recognition and genetic testing are crucial for accurate diagnosis and appropriate care. Given the 25% possible risk of IPS in future pregnancies, genetic counseling is essential for affected families [11]. The primary management focuses on supportive care for respiratory distress and meticulous skin care to prevent complications. A coordinated approach involving neonatologists, dermatologists, and geneticists is essential for optimal patient outcomes.

While this IPS case is widely reported in Scandinavian populations, the occurrence of the same in an Iraqi patient suggests that it is more widely distributed than may have been understood earlier [12].

The case is significant because it is the first-ever reported case of IPS in Iraq. Such rare conditions should be highlighted and documented from various geographical locations so as to increase global awareness and thereby influence patient management. The importance of this case, therefore, was to illustrate 1 addition to what is otherwise a very small pool of reports on IPS and variability in clinical presentation, hence the need for a high index of clinical suspicion. Such variability reinforces the need for an all-encompassing and flexible approach to diagnosis and management. Future research should focus on gaining more information about the genetic basis and clinical spectrum of the disorder to develop better diagnostic techniques and therapeutic strategies [13,14,11].

Conclusion

IPS is a rare genetic disorder that requires early diagnosis and management from a multidisciplinary team for better outcomes. The presented case, first in Iraq, indicates that physicians need to have IPS in mind for premature neonates presenting with distinct cutaneous features along with respiratory distress. Care for the whole patient that includes genetic testing and supportive therapeutic modes is very crucial in the proper management of IPS and prevention of associated complications. Such families will need genetic counseling to explain this mode of inheritance of the autosomal recessive condition and the implications that have for any future pregnancies. This case underlines early recognition and management with coordinated care as key in IPS.

Patient consent

Informed written consent was obtained from the parents of the neonate for the publication of their child's anonymized information in this article.

Ethics approval

Our institution does not require ethical approval for reporting individual cases or case series.

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